

NEEA Emerging Technology Report – Q1 – 2017

Emerging Technology Project List						
Technologies	Description	Sector	Product Manager	Portfolio Start Schedule	TP aMW	Updates
Advanced HVAC Solution and Roof Top Units (RTU)	NEEA staff is scanning for efficient alternatives to existing roof top units. Past research has explored evaporative cooling and advanced controls. Currently we are testing a systems approach to separating ventilation control from building heating and cooling. The approach includes an efficient Heat Recovery Ventilation (HRV) system for Dedicated Outside Air and a hydronic or variable refrigerant flow (VRF) for building heating and cooling.	Commercial	John Jennings / Charlie Stephens	2017-2018	85	Our field research is continuing of a very high efficiency dedicated outdoor air systems (DOAS) using a very efficient heat recovery ventilation (HRV) system from Ventacity Systems and VRF or DHP heating and cooling systems. Two (2) systems were commissioned in Q4 and two (2) other systems were designed and installed. There are now seven (7) projects completed or nearing completion, one that will begin in January, and one at Portland State University (PSU) that is in scoping (whole building, or 2 zones as a pilot). We expect 9 pilot projects in all. Q4 work also included preliminary data collection and some preliminary data analysis and model calibration that will continue over the winter and through 2017.
Dynamic Glass	Dynamic glass is glazing that adapts to changing natural light to lower glare and solar gain. Most are also double pane providing high insulation benefits.	Commercial	Rob Curry	2019 or later	40	Seattle IDL is conducting a one-year evaluation study of a 90,000 SF six story UNICO office building in Seattle with electrochromic primary window replacement manufactured by VIEW. The study will run through Q1 2017
Extended Products for Motor Driven Systems	Integrated motor systems with optimized performance to a system curve. Includes motor, controller, and fan / pump / compressor combinations.	Commercial / Industrial	Geoff Wickes	2017	150	Clear water pump systems were reviewed by the Regional Technical Forum (RTF) in December and over 3,400 provisional unit energy savings were approved for motor systems less than 200 hp. NEEA staff is continuing to participate actively with ACEEE and industry market actors to expand this approach to compressors and fans. NEEA and ACEEE hosted Informal session at ACEEE Summer Study.
Pump Operator Certification	Certification for pump operators who demonstrate mastery of efficiency.	Industrial	Geoff Wickes		20	Hydraulic Institute (HI) has completed Pump System Assessment training course and certificate was released September 2016. The Pumps System Assessment Profession (PSAP) is on track for a release late 2017. Once the certification is complete, NEEA staff will consider evaluating the energy savings potential of a certified specialist. NEEA staff has offered to HI the option to repurpose the Refrigeration Engineers and Technicians Association (RETA) certification tracking database.
Compressed Air Saving Unit	This is an add-on product to compressed air systems. It reduces air consumption by	Industrial	Geoff Wickes	2017	8	NEEA and BPA worked together to complete research into the market size and savings potential for this product.

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	interrupting air flow through engineered air nozzles.					Parker Hannifin manufacturer's reps are socializing the product and finding test sites for future work. NEEA's emerging technology group will be hosting two presentations one by Parker Hannifin and the other by Nexmatic January 24 th at 10:30- 12:00
Combo Hot Water & Space Heating – Ductless Heat Pump (DHP) Includes Carbon Dioxide (CO2) heat pumps	Leverage inverter-driven heat pump technology for space conditioning and domestic hot water.	Residential	Dave Kresta / Charlie Stephens	2017-2018	194	Mitsubishi combo product has been delayed due to Rheem exiting the partnership. No timeline for commercialization as of 1/4/2017. BPA/ Washington State University (WSU) field- and lab-testing of a new Sanden "EcoRuno" combo system from Japan is underway. Note that the prior version of product has been found to be inadequate for space and water heating, and will be released by Sanden as a split-system heat pump water heater (HPWH).
Clothes Washers	Field data revealed washers test procedure does not adequately estimate the remaining moisture (and consequently drying energy needed). We can improve the test procedure and pursue greater savings.	Residential	Christopher Dymond	2018 – add to Dryers Initiative	36	We are developing a scope of work for additional testing that will quantify impact and help establish the benefit of pairing an Energy Star Washer with an Energy Star Dryer.
Advanced Water Heater systems	Water heaters that don't fit the integral product covered by the federal standard. Includes split systems.	Residential	Dave Kresta/ Geoff Wickes	2017-2018	354	Product is available in the Northwest and North America in general. RTF issued a "Planning" status on the Tier 4 Sanden product but it is currently challenged by the cost effectiveness. NEEA staff plan to publish the Advanced Water Heater Specification qualified products list after the working group has a chance to review the reports. NEEA's portfolio management team agreed to prepare split system water heaters to be included into NEEA's portfolio as a part of the heat pump water heater program. NEEA staff is preparing a proposal for the Regional Portfolio Advisory Committee (RPAC) that will be reviewed in 2017.
Window Attachments	Blinds and permanently installed high performance storm windows	Residential	Rob Curry	2017	100	NEEA's portfolio management team agreed to prepare residential window attachments for inclusion into NEEA's portfolio as a part of the commercial window attachment program. Both products are focused on national energy ratings developed and maintained by the Attachment Energy Rating Council. NEEA staff is preparing a proposal for the Regional Portfolio Advisory Committee (RPAC) that will be

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						reviewed in 2017.
Next Generation/UHD TVs	4K Ultra High Definition (UHD) TVs with various forms of High Dynamic Range (HDR), wide color gamut, smart features are quickly gaining consumer market share. The current DOE test method contains gaps and loop holes and does not adequately test the next generation technologies. Several new display technologies unique from LED back lit LCDs are emerging.	Residential	Nick Leritz	(in Retail Product Portfolio)	57	<p>May 2016 EPA released new certification testing guidelines for TVs with screen luminance features that may skew energy consumption test results. The Department of Energy (DOE) also release an Request for Information (RFI) regarding the same screen luminance features with the intent of guiding future test method procedures.</p> <p>NEEA commissioned Ecos Research to research and report how to better understand and improve the TV test procedure, what qualities a new test clip should possess, and how to make progress toward an optimal long-term test procedure in the interim to better inform current labeling and incentive programs. The report is published on NEEA.org.</p> <p>ENERGY STAR Version 8 development process is underway with draft 1 being finalized.</p>
Connected Thermostats	Residential thermostats that control various heating and cooling equipment, utilize weather and occupancy data to better manage the systems, and engage homeowner to more closely manage energy use and comfort.	Residential	Dave Kresta		226	No updates. RETAC will be convening a group to discuss collaboration around tstats, and the Consumer Products Regional Market Strategy has identified it as a priority product.
Ductless Heat Pump Product Innovations and Channel Developments	Quick connect ductless heat pumps are common in other parts of the world. They enable end users or contractors to install a DHP without having a refrigerant license. Exploration of new market channels direct to General Contractors and Electricians.	Residential	Geoff Wickes		100	Four test units have been installed in the Portland Metro. Initial results look very promising. Leak tightness testing will continue for one year with regular check ins to verify performance Initial Report due Q1 of 2017
Pivot Commissioning	Pumping energy is used to compensate for poorly maintained pivot systems. We are exploring ways for growers to monitor pivot performance to achieve maximum efficiency of current equipment	Agricultural	Geoff Wickes	TBD	10	The Project is still on hold pending the release of the BPA Market Characteristic Study and the updated Scientific Irrigation Scheduling (SIS) analysis. NEEA staff will start working with the new BPA Lead David Lee as soon as he gets up to speed after Jennifer Eskil's retirement.

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Inverter Driven Packaged Terminal Heat Pumps (PTHP), Package Terminal Air Conditioners (PTAC)	PTACs and PTHPs that used the same inverter driven compression cycles that DHPs use. Potentially quieter and capable of operating at lower OATs than current options.	Residential, small commercial	Christopher Dymond	TBD	TBD	Preliminary investigation of current equipment manufactures, and distributors. Only a few 9,000-15,000 Btuh options currently available – cost roughly \$1.1k @. Potential DIY system with that uses 120V source could be great option for motels, manufactured homes and apartment buildings.

TP – Technical potential – maximum possible savings over 20 years

MS – Market Share

Emerging Technology Strategic Activities					
Strategies	Description	Sector	Product Manager	Next Milestone	Notes
Automated Measurement and Verification (M&V) (Used to be Low Cost Whole Building Energy Metering); also incorporates industrial, commercial and residential energy management information systems (EMIS)	Exploring how low cost sensors and / or improved analytics can be used to reduce the cost of measurement and verification of savings	All	Nick Leritz John Jennings	Completion of three-year study of Bullitt foundation building's use of an advanced energy management system. 2018	The energy efficiency power purchase agreement between Seattle City Lighting and the Bullitt building in Seattle reached its first year milestone. EnergyRM's DeltaMeter demonstrated promising performance against an independent model and actual energy use. An explanation of the project can be found here. http://www.meetscoalition.org/pilot-projects/ . An independent evaluation requested by Seattle City Light of NEEA's Validation process used at Bullitt was completed in December. Data collection and validation work continues into 2017.

Unsolicited Proposals – Received in the last quarter.				
Date Received	Title	Sector/Description	Decision	Explanation of Decision
10/13/2016	Session suggestion for conference – “Addressing the Condo Market Successfully”	This proposal was not for a specific technology but for a session idea centered on the untapped potential of condominiums.	Not an emerging technology	Consider for efficiency exchange

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Date Received	Title	Sector/Description	Decision	Explanation of Decision
11/29/2016	NW Electric Vehicles Market Development Platform (Pilot)	We propose to develop and launch a Regional Electric Vehicle (EV) Market Development Platform that will engage key market stakeholders, inspire and influence market activities, increase regional market intelligence and educate NW consumers on the value and benefits of electric vehicles.	Consider proposal as part of electric vehicle prospectus for NEEA board.	Electric vehicles and transportation efficiency are currently out of scope for NEEA, but NEEA’s board is considering options for future work.
12/6/2016	Monitoring software to maintain IT network	This software product operates in the client server environment and monitors and manages network activity in order to minimum unplanned network outages	Not a fit for NEEA	This product is not designed to improve energy efficiency but rather IT network reliability.

Technologies / Projects - Moved from Scanning or incorporated into another project

Title	Description	Sector	Product Manager	Technical Potential for Savings	Status
Municipal water supply leak detection and correction	Studies of water supply indicate significant losses of water from leaks in the supply system. Losses range from 15-70%. These pre-meter losses affect operating costs. Best practices for leak detection and correction techniques are available, but it is not clear if these practices would help our region.	Industrial	Mark Rehley	20	Removed from active scanning. Savings are small given the market challenges. Report is available on ConduitNW at this location. https://conduitnw.org/Pages/File.aspx?rid=3626
Home Energy Preliminary Score	Generate home energy performance ratings for all existing homes based on publically available data.	Residential	Christopher Dymond	N/A	Market place is proceeding with this concept on its own. The metric might not be accurate or sufficient for utilities, but there isn’t a good leverage point for NEEA to intervene at this time.
First Cost Barrier Removal Options	Higher incremental first cost is a problem for most energy efficiency technologies. This is especially true before the new technology reaches scaled production. We are investigating innovative ways to reduce or eliminate the barrier associated with the first cost.	Residential	Dave Kresta	N/A	Report published to NEEA.org. No further work anticipated at this time.